

**REMARKS**

Claims 18 and 26 are amended. No new claims are added. Claims 1-31 are pending for consideration. In view of the following remarks, Applicant respectfully requests reconsideration and allowance of the subject application.

**Specification Objections**

The Office objects to Applicant's use of trademarks in its specification. Applicant has amended the relevant paragraph and requests that this objection be withdrawn.

**Drawing Objections**

The Office objects to Applicant's drawings because certain reference signs are mentioned in the description but are not shown on the drawings. Applicant has amended the relevant paragraph of the specification to remove all mention of the specified reference signs (i.e., server operating system 22, Internet Information Server 24, platform 26, and application(s) 30). In addition, Applicant has changed the top and left margins of Fig 2. Applicant requests that all drawing objections be withdrawn.

**§ 101 Rejections**

Claims 18-21 and 26-31 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Applicant disagrees with the rejections and traverses the Office's rejections.

The Patent Office has provided an "Examination Guideline for Computer-Related Inventions" which is particularly instructive in considering the above

1 claim rejections. In this guideline, the Office discusses non-statutory subject  
2 matter as such relates to computer-related inventions. Specifically, the Office  
3 describes two types of descriptive material—functional and non-functional.

4 Functional descriptive material consists of data structures and computer  
5 programs which impart functionality when encoded on a computer-readable  
6 medium. Such data structures and programs are statutory when embodied on a  
7 computer-readable medium.

8 A “data structure” is defined, in the PTO’s guidelines, as a “physical or  
9 logical relationship among data elements, designed to support specific data  
10 manipulation functions.” (See, footnote 27, citing to *The New IEEE Standard  
11 Dictionary of Electrical and Electronics Terms* 308 (5<sup>th</sup> ed. 1993)). Non-  
12 functional descriptive material, on the other hand, includes but is not limited to  
13 music, literary works and a compilation or mere arrangement of data.

14 Claim 18 has been amended and now recites a Web server input string  
15 screening tool embodied *on a computer-readable medium*. Applicant submits  
16 that this claim is allowable and requests the Office to withdraw its § 101 rejection  
17 of this claim.

18 Claims 19-21 depend from claim 18 and are allowable as depending from  
19 an allowable base claim. Applicant requests the Office to withdraw its § 101  
20 rejection of these claims, as well.

21 As amended, claim 26 recites a collection of Web server screening patterns  
22 embodied on a computer-readable medium comprising:

- 23
- a memory; and
  - 24 • a plurality of attack patterns stored in the memory, the attack  
25 patterns *being useable* to screen input strings that are intended for

1 use by a Web server, individual attack patterns being defined in a  
2 manner that permits variability among their constituent parts.

3 The Office argues that the claimed collection of screening patterns is a data  
4 structure and non-functional. Applicant respectfully disagrees and traverses the  
5 Office's rejection.

6 In this particular situation, it is perhaps instructive to consider the Federal  
7 Circuit case of *In re Lowry*, 32 F.3d 1579 (1994), where the Court addressed the  
8 issue of whether a data structure claim met the statutory requirements of §101.  
9 The independent claim that was at issue in that case is presented directly below for  
10 the convenience of the Office:

11 1. A memory for storing data for access by an application  
12 program being executed on a data processing system, comprising:  
13 a data structure stored in said memory, said data structure including  
14 information resident in a database used by said application program and  
15 including:

16 a plurality of attribute data objects (ADOs) stored in said  
17 memory, each of said attribute data objects containing different  
18 information from said database;

19 a single holder attribute data object for each of said attribute  
20 data objects, each of said holder attribute data objects being one of  
21 said plurality of attribute data objects, a being-held relationship  
22 existing between each attribute data object and its holder attribute  
23 data object, and each of said attribute data objects having a being-  
24 held relationship with only a single other attribute data object,  
25 thereby establishing a hierarchy of said plurality of attribute data  
objects;

a referent attribute data object for at least one of said attribute  
data objects, said referent attribute data object being  
nonhierarchically related to a holder attribute data object for the  
same at least one of said attribute data objects and also being one of  
said plurality of attribute data objects, attribute data objects for  
which there exist only holder attribute data objects being called  
element data objects, and attribute data objects for which there also  
exist referent attribute data objects being called relation data objects;  
and

1 an apex data object stored in said memory and having no  
2 being-held relationship with any of said attribute data objects,  
3 however, at least one of said attribute data objects having a being-  
4 held relationship with said apex data object.

5 In this case, the Federal Circuit noted that Lowry's ADOs do not represent  
6 merely underlying data in a database. The Court commented that the ADOs  
7 contain both information used by application programs and information regarding  
8 their physical interrelationships within a memory.

9 In the same way as Lowry's claims contained both information used by  
10 application programs and information regarding the physical interrelationship of  
11 the ADOs within a memory, claim 26 recites subject matter that contains both  
12 *information that is useable by software* (i.e. "... attack patterns being *useable* to  
13 screen input strings that are intended for use by a Web server. . . ."), as well as  
14 *information regarding the interrelationship of the data elements* within a memory  
15 (i.e. "... individual attack patterns being defined in a manner that permits  
16 variability among their constituent parts."). Thus, as the claim in Lowry, this  
17 claim defines functional characteristics of the computer-readable media.

18 In characterizing Lowry's claim, the Court noted that Lowry did not claim  
19 merely the information content of a memory. In the Court's view, although  
20 Lowry's data structures did include data resident in a database, the data structures  
21 depended only functionally on information content. While the information content  
22 affected the exact sequence of bits stored in accordance with Lowry's data  
23 structures, the claims, in the Court's opinion, required specific electronic structural  
24 elements which imparted a physical organization on the information stored in  
25 memory. The physical organization embodied in the claimed subject matter is the

1 organization that is provided through an attack pattern's definition in a manner  
2 that permits variability among its constituent parts. This variability leads to a  
3 more flexible and robust attack pattern search by those systems that employ the  
4 claimed attack patterns.

5 As noted by the Court, in Lowry's invention, the stored data existed as a  
6 collection of bits having information about relationships between the ADOs. This  
7 was deemed by the Court as the essence of electronic structure. Similarly, the  
8 claimed subject matter exists as a collection of bits that have information about the  
9 interrelationship of an attack pattern's constituent parts.

10 As the Court further noted, more than mere abstraction, the data structures  
11 were specific electrical or magnetic structural elements in a memory. According  
12 to Lowry, the data structures provided tangible benefits: data stored in accordance  
13 with the claimed data structures were more easily accessed, stored, and erased.  
14 The Court further observed that, unlike prior art data structures, Lowry's data  
15 structures simultaneously represented complex data accurately and enabled  
16 powerful nested operations. As the Court noted, in short, Lowry's data structures  
17 were physical entities that provided increased efficiency in computer operation.  
18 Hence, the Court found the recited data structure statutory under § 101.

19 In much the same way, claim 26 recites statutory subject matter that defines  
20 specific elements in memory that provide tangible benefits—that of screening  
21 input strings that are intended for use by a Web server in a flexible and robust  
22 manner. To this end, Applicant's recited data structure is a physical entity that  
23 provides increased efficiencies in screening input strings.

24 Accordingly, Applicant respectfully traverses the Office's rejection and  
25 submits that claim 26 is allowable.

1       **Claims 27-31 are allowable as depending from an allowable base claim.**

2  
3       **35 U.S.C. §§ 102 and 103 Rejections**

4       Claims 1-11 and 13-30 stand rejected under 35 U.S.C. § 102(a) as being  
5 anticipated by U.S. Patent No. 5,884,033 to Duvall et al (hereinafter, "Duvall").  
6 Claims 12 and 31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable  
7 over Duvall in view of Oliver et al., "Building a Windows NT 4 Internet Server",  
8 1996, p. 203.

9  
10       **The Duvall Reference**

11       The reference to **Duvall** discloses a client-based filtering system. The  
12 system allows a user to filter material received over the Internet that is personally  
13 objectionable, whether that material is sexually explicit, violent, politically  
14 extreme, or otherwise, depending on the user's individual tastes and sensitivities.

15       The filter compares portions of incoming and/or outgoing messages to  
16 filtering information in a filter database and determines whether to block or allow  
17 incoming and/or outgoing transmissions of messages in response to the  
18 comparison. In response to a match between the portion of the message and the  
19 filtering information, the system can employ one of a number of different  
20 specified blocking options. The system has an update server that is accessible over  
21 the Internet and that has new filtering information for updating the filter database.

22  
23       **Claims 1-6**

24       **Claim 1** recites a Web server input string screening method comprising  
25 [emphasis added]:

- 1 • determining an *attack pattern* that can be used to *attack a Web*
- 2 *server*;
- 3 • defining a search pattern that can be used to detect the *attack*
- 4 *pattern*, the search pattern being defined in a manner that permits
- 5 variability among its constituent parts;
- 6 • receiving an input string that is intended for use by a Web server;
- 7 • evaluating the input string using the search pattern to ascertain
- 8 whether the *attack pattern* is present; and
- 9 • implementing a remedial action if an *attack pattern* is found that
- 10 matches the search pattern.

11 In the Office Action, the Office rejects this claim under 35 U.S.C. § 102  
12 and argues that Duvall anticipates the claimed subject matter. Specifically, the  
13 Office argues that Duvall “defines a plurality of unwanted input strings to be  
14 filtered (see column 3, line 64 to column 4, line 11), a search pattern that permits  
15 variability, can search a portion of the string, and has wildcard characters (see  
16 column 6, lines 28-42), receives an input string on a web server (see column 8,  
17 lines 18-27), evaluates the strings, and takes remedial action if necessary,  
18 including denying the request (see column 6, line 60 to column 7, line 13).”

19 Applicant submits that Duvall does not anticipate this claim and  
20 respectfully traverses the rejection. According to MPEP § 706.02, “for  
21 anticipation under 35 U.S.C. 102, the reference must teach *every aspect* of the  
22 claimed invention either explicitly or impliedly. Any feature not directly taught  
23 must be *inherently present*.”

24 The first element of claim 1 recites “determining an *attack pattern* that can  
25 be used to *attack a web server*.” Duvall does not disclose this; and, in fact, the  
Office does not even *cite* Duvall for this feature. Furthermore, Duvall does not  
even *remotely* suggest determining an *attack pattern* that can be used to *attack a*  
*Web server*. Duvall’s disclosure actually has absolutely *nothing* to do with Web

1 server attacks. Instead, Duvall's disclosure deals with a system in which a user can  
2 filter material received over the Internet that is *personally objectionable*, whether  
3 that material is sexually explicit, violent, politically extreme, or otherwise,  
4 depending on that user's *individual tastes and sensitivities*. This is very different  
5 from and not to be confused with determining an *attack pattern* that can be used to  
6 *attack a Web server*. Accordingly, for at least these reasons, this claim is  
7 allowable.

8 Claims 2-6 depend either directly or indirectly from claim 1 and are  
9 allowable as depending from an allowable base claim. These claims are also  
10 allowable for their own recited features which, in combination with those recited  
11 in claim 1, are neither disclosed nor taught by the references of record, either  
12 singly or in combination with one another.

#### 13 14 Claims 7-12

15 Claim 7 recites a Web server input string screening method comprising  
16 [emphasis added]:

- 17
- 18 • defining one or more search patterns that comprise literal characters  
19 and special characters, wherein the literal characters indicate exact  
20 characters in an input string that is intended for receipt by a Web  
21 server, and the special characters indicate variable characters in an  
22 input string that is intended for receipt by the Web server, the search  
23 patterns being usable to search for an *attack pattern* that can be used  
24 to *attack the Web server*; and
  - 25 • storing the one or more search patterns in a memory location that is  
accessible to a screening tool for evaluating an input string that is  
intended for receipt by the Web server.

24 In making out the rejection of this claim, the Office again argues that  
25 Duvall anticipates this claim. Once more, Applicant respectfully submits that



1 Duvall does not anticipate this claim. As noted above, Duvall discloses *nothing* of  
2 search patterns that are useable to search for an *attack pattern* that can be used to  
3 *attack a Web server*. Moreover, Duvall does not even *suggest* any sort of method  
4 whatsoever for dealing with attack patterns, let alone their use in connection with a  
5 Web server. Accordingly, for at least these reasons, this claim is allowable.

6 **Claims 8-12** depend from claim 7 and are allowable as depending from an  
7 allowable base claim. These claims are also allowable for their own recited  
8 features which, in combination with those recited in claim 7, are neither disclosed  
9 nor taught by the references of record, either singly or in combination with one  
10 another.

11 In addition, with respect to claim 12, which is rejected in view of Oliver,  
12 that reference is not seen to add anything of significance given the allowability of  
13 this claim and the failure of Duvall to anticipate claim 7.

14  
15 **Claims 13-17**

16 **Claim 13** recites a Web server input string screening method comprising  
17 [emphasis added]:

- 18
- 19 • defining one or more search patterns that are specified as a regular  
20 expression, the search patterns being usable to search for an *attack*  
21 *pattern* that can be used to *attack the Web server*; and
  - 22 • storing the one or more search patterns in a memory location  
23 that is accessible to a screening tool for evaluating an input  
24 string that is intended for receipt by the Web server.

25 Again, the Office rejects this claim under § 102 by arguing that Duvall  
discloses that "the search patterns may be stored in RAM." The Office cites to  
column 4, lines 45-49, which are reproduced below:

1 The system then checks for and retrieves any filters that match the  
2 particular IP address. The retrieved filters are checked to determine  
3 if any require immediate action, i.e., if unconditional allowing or  
4 blocking is required (steps 104, 106).

5 Applicant respectfully submits that Duvall neither discloses nor suggests  
6 the subject matter of this claim. Specifically, Duvall neither discloses nor suggests  
7 search patterns that are usable to search for attack patterns that can be used to  
8 attack a Web server. Accordingly, for at least these reasons, this claim is  
9 allowable.

10 Claims 14-17 depend from claim 13 and are allowable as depending from  
11 an allowable base claim. These claims are also allowable for their own recited  
12 features which, in combination with those recited in claim 13, are neither disclosed  
13 nor taught by the references of record, either singly or in combination with one  
14 another.

#### 15 Claims 18-21

16 As amended, Claim 18 recites a Web server input string screening tool  
17 embodied on a computer-readable medium comprising [emphasis added]:

- 18 • a pattern matching engine that is configured to receive an input  
19 string that is intended for use by a Web server and evaluate the input  
20 string to ascertain *whether it likely constitutes an attack on the Web*  
21 *server*; and
- 22 • one or more patterns that are usable by the pattern matching engine  
23 to evaluate the input string, the patterns being defined in a manner  
24 that permits variability among the constituent parts of the one or  
25 more patterns.

23 The Office rejects this claim, again citing Duvall. Applicant respectfully  
24 traverses the rejection. Duvall neither discloses nor suggests a pattern matching  
25 engine that is configured to evaluate an input string to ascertain *whether it likely*

1 *constitutes an attack on a Web server.* Accordingly, for at least these reasons, this  
2 claim is allowable.

3       Claims 19-21 depend from claim 18 either directly or indirectly and are  
4 allowable as depending from an allowable base claim. These claims are also  
5 allowable for their own recited features which, in combination with those recited  
6 in claim 18, are neither disclosed nor taught by the references of record, either  
7 singly or in combination with one another.

8  
9       Claims 22-25

10       Claim 22 recites one or more computer readable media having computer-  
11 readable instructions thereon which, when executed by a computer perform the  
12 following steps [emphasis added]:

- 13       • receiving an input string that is intended for use by a Web server;  
14       • evaluating the input string using a search pattern to ascertain  
15       whether the input string contains an *attack pattern* that can be used  
16       to *attack the Web server*, the search pattern comprising literal  
17       characters and special characters, wherein literal characters indicate  
18       exact characters in the input string, and the special characters  
19       indicate variable characters in the input string; and  
20       • implementing a remedial action if an *attack pattern* is found that  
21       matches the search pattern.

22       In making out the rejection of this claim, the Office again cites Duvall.  
23       However, Duvall does not disclose or suggest the act of evaluating an input string  
24       using a search pattern to ascertain whether the input string contains an *attack*  
25       *pattern* that can be used to *attack a Web server*. Because Duvall does not teach or  
26       suggest such an evaluation, it cannot possibly disclose implementing a remedial

1 action if an *attack pattern* is found that matches the search pattern. Accordingly,  
2 for at least these reasons, this claim is allowable.

3 **Claims 23-25** depend either directly or indirectly from claim 22 and are  
4 allowable as depending from an allowable base claim. These claims are also  
5 allowable for their own recited features which, in combination with those recited  
6 in claim 22, are neither disclosed nor taught by the references of record, either  
7 singly or in combination with one another.

8  
9  
10 **Claims 26-31**

11 As amended, **claim 26** recites a collection of Web server screening patterns  
12 embodied on a computer-readable medium comprising:

- 13
- 14 • a memory; and
  - 15 • a plurality of *attack patterns* stored in the memory, the *attack*  
16 *patterns* being useable to screen input strings that are intended for  
17 use by a Web server, individual *attack patterns* being defined in a  
18 manner that permits variability among their constituent parts.

19 Again, the Office rejects the claim under § 102 by arguing that  
20 Duvall discloses that "the search patterns may be stored in RAM." The  
21 Office cites to column 4, lines 45-49, which was reproduced earlier.

22 This claim has been amended to clarify that the patterns referred to are  
23 *attack patterns*. As discussed earlier, Duvall does not disclose attack patterns.  
24 Therefore, Duvall cannot possibly teach a plurality of *attack patterns* stored in  
25 memory. Accordingly, for at least these reasons, this claim is allowable.

**Claims 27-31** depend from claim 26 and are allowable as depending from  
an allowable base claim. These claims are also allowable for their own recited

1 features which, in combination with those recited in claim 26, are neither disclosed  
2 nor taught by the references of record, either singly or in combination with one  
3 another.

4 In addition, with respect to claim 31, which is rejected in view of Oliver,  
5 that reference is not seen to add anything of significance given the allowability of  
6 this claim.

7  
8 **Conclusion**

9 All of the claims are in condition for allowance and Applicant respectfully  
10 requests a Notice of Allowability be issued forthwith. If the next anticipated  
11 action is to be anything other than issuance of a Notice of Allowability, Applicant  
12 respectfully requests a telephone call for the purpose of scheduling an interview.  
13

14  
15 Respectfully Submitted,

16  
17 Dated: 11/4/03

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